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THE USE OF VIDEO PROCESSES IN TEACHER EDUCATION.

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UTAH STATE BOARD OF EDUCATION, SALT LAKE CITY

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DESCRIPTORS- *TEACHER EDUCATION, *INSTRUCTIONAL IMPROVEMENT, *EPISODE TEACHING, *MICROTEACHING, *VIDEO TAPE RECORDINGS, EQUIPMENT MAINTENANCE, STUDENT TEACHERS,

TECHNOLOGICAL INNOVATIONS CAN BE USED TO IMPROVE TEACHER EDUCATION. A MULTI-STATE TEACHER EDUCATION PROJECT PLANS AND DEVELOPS PROGRAMS FOR MICROTEACHING WITH THE HELP OF VIDEOTAPE RECORDERS (VTR). MICROTEACHING, THE ISOLATION OF SPECIFIC ASPECTS OF THE TEACHING TASK, ENABLES TRAINEES TO FOCUS ON AND ACQUIRE TECHNIQUES OF INSTRUCTION WITH THE BENEFIT OF IMMEDIATE FEEDBACK. FIFTEEN VIDEOTAPES SHOWING CLASSROOM EPISODES ARE RECORDED, COVERING DIFFERENT SITUATIONS--(1) SUPERIOR TEACHER AT WORK, (2) STUDENT TEACHER AT WORK, AND (3) STRUCTURED OBSERVATIONS OF CLASSROOM ACTIVITIES. A BANK, CONSISTING OF TAPES AND FILMS OF MODEL CLASSROOM SITUATIONS, IS ENVISIONED. MAJOR CONCLUSIONS ARE THAT STUDENT TEACHERS APPROVE OF MICROTEACHING, THAT TEACHERS CAN OPERATE VTR EQUIPMENT, AND THAT REPAIRING AND MAINTAINING EQUIPMENT PRESENTS A SERIOUS, COMPLICATED PROBLEM, REQUIRING SERVICE ARRANGEMENTS WITH SALES AGENCIES. AN ANNOTATED LIST OF TAPES PRODUCED IS INCLUDED. (OH)

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THE USE OF VIDEO PROCESSES IN TEACHER EDUCATION

A REPORT OF PROJECT ACTIVITIES IN UTAH

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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THE USE OF VIDEO PROCESSES

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FOREWORD

The Multi-State Teacher Education Project represents the combined efforts of seven states (Florida, Maryland, Michigan, South Carolina, Washington, West Virginia, and Utah) with the aid of grants from the federal government, to improve teacher education and preparation in the several states. The multi-state nature of the project is an innovation. M-STEP is not seven different state projects but one project in which seven states are participating. The seven-state compact is an effort to strengthen teacher education and enhance leadership roles at the state level. It is believed that by pooling resources and cooperating in projects such as this, state departments of education will increase in effectiveness as they broaden their services and extend their leadership.

Utah has focused specifically on the use of instructional media to improve laboratory experiences for pre-service and in-service teachers. In this regard, our activities have a high degree of commonality with those of South Carolina and Maryland. An attempt is also being made to improve teacher education through the introduction of innovative modifications in teaching internships, student teaching centers, and block programs. This has relevance to projects being developed in West Virginia and Michigan. In-service and other phases of the Utah project are related to project activities in the states of Florida and Washington. Periodic conferences, workshops, and inter-visitations have been held for the purpose of developing, correlating, and evaluating the project.

Evidence of progress is already apparent. Microteaching and other uses of the videotape recorder are indicative of significant changes that are taking place in the preparation of teachers. But we have witnessed only the beginning! Seeds have been sown which could result in a major overhaul of teacher education programs. We are living at a time when there has been much emphasis on the need for change and innovation, but we need to insure that whatever changes come are orderly and systematic and aimed at upgrading that most important of all products--the children and youth of this nation.

T. H. BELL
State Superintendent
of Public Instruction

INTRODUCTION

This monograph has been prepared by Dr. Vere A. McHenry, Utah Coordinator of the Multi-State Teacher Education Project, from reports submitted to him by participating institutions in this state.

This project, funded under Section 505 of Public Law 89-10, has had a great affect upon developing new practices in student teaching in this and the other states. The use of instructional media, especially television, has been explored and accepted as an important factor to be used in improving student teaching.

The enthusiastic cooperation expressed by the teacher-preparation colleges and universities has been extremely gratifying. The seed has been sown modestly, and the first crop of ideas and results has been more bountiful and valuable than expected.

It is our desire to share some of our beginning experiences with other states. For this purpose this monograph has been prepared for distribution.

We acknowledge the valuable contribution made by Dr. McHenry and the administrators and staff members of the cooperating institutions and to the consultants from the Instructional Media Division of the Utah Office of the State Superintendent of Public Instruction, local school districts, and from other states, as well as to Drs. Howard Bosley and Charles Franzen of the Central M-STEP Office.

N. Blaine Winters
Utah Director of M-STEP

MICROTEACHING AT BRIGHAM YOUNG UNIVERSITY*

Microteaching is a recent development in teacher education in which a miniature teaching situation is created under controlled conditions. All of the elements of the teaching act are present. The uniqueness of microteaching consists of two elements: (1) the ease with which the teaching situation can be controlled and manipulated, and (2) the availability of immediate feedback for the student teacher.

The term microteaching was coined at Stanford University to describe teacher education procedures developed in connection with the Ford Foundation financed Secondary Education Project of the university. Teacher education personnel at Stanford have conceived of microteaching as a way to break down the complex act of teaching into simpler components. Today microteaching, at least in principle, is being used in several institutions of higher learning in the United States.

At Brigham Young University microteaching has been the subject of experimentation since the spring semester of 1966. What has been found has proved encouraging to the degree that the principle of microteaching is now considered an integral part of the BYU teacher education program, whatever direction its ultimate development might follow.

Early in 1967 Brigham Young University entered into contract with the Utah State Board of Education to perform the following services in connection with Utah's participation in the Multi-State Teacher Education Project:

1. Identify criteria for model videotapes for use in microteaching which will demonstrate strategies for effective teaching behavior.

2. Screen presently available videotapes and films on microteaching for inclusion in a bank of model tapes and films.

3. Prepare model tapes for demonstration of microteaching techniques when they are not available and prepare videotapes of model teacher behavior to be used in microteaching sessions.

4. Participate in workshops for personnel of Utah Teacher Training institutions and school districts and any M-STEP workshops.

*Project Directors, Dr. J. Hugh Baird and Dr. W. Dwayne Belt, Associate Professors of Teacher Education, College of Education, Brigham Young University, Provo, Utah.

Model Videotapes

Brigham Young University has begun to identify and test a number of abilities a teacher should possess to be effective in the classroom. The list should be used as an hypothesis and must be tested and modified by each subsequent user.

To be effective in the classroom, a teacher should be able to do the following:

- Teach inductively, giving appropriate cues and reinforcement when necessary.
- Arrest the attention of uninterested students in a positive friendly way and keep it while teaching a lesson.
- Get, and keep, students actively involved in the learning of concepts.
- Teach and use student inquiry methods to help students learn concepts and learn how to learn.
- Give assignments clearly and without ambiguity.
- Present the referent of a concept to learners either directly or vicariously in such a way that it may be easily perceived.
- Use vocabulary and information at a level of readiness so that learners are challenged but not frustrated.
- Teach a concept with a minimum or no "teacher talk" involved in the teaching.
- Reinforce pupil responses in a variety of ways.
- Use and differentiate questions which are cognitive memory, convergent, divergent, and evaluative. Such questions must be relevant to the topic and should possess little ambiguity.

Tapes and Films on Microteaching

Personnel from the College of Education of Brigham Young University have searched but found no videotapes or films on microteaching other than the tape and kinescope produced by Brigham Young University and the Multi-State Teacher Education Project entitled "Microteaching at BYU".

Stanford University has a collection of "before-after" taped episodes which may be viewed if equipment is compatible with theirs and if one wishes to see the effect of microteaching on the teaching behavior of a student teacher. Two before-after episodes are available at SYU.

Time was spent at Hunter College viewing tapes and kinescopes of model behavior. Excellent materials were seen but are not presently available outside of New York State.

Stanford is working on a series of model tapes to accompany the categories of behavior which are included in the "Stanford Teacher Competence Appraisal Guide".

Ohio State University and others are working on projects which will eventually produce banks of model tapes. This activity seems to be mushrooming.

Model Tapes of Microteaching Techniques and Tapes of Model Teacher Behavior

Two videotapes have been produced. The first contains eight episodes, each illustrating one or more of the abilities listed in number 1 above. Following is a brief description of each episode:

1. The first episode shows a class of third, fourth, and fifth graders. The student teacher is teaching the concept "Certain areas on our tongues have taste buds which taste only certain tastes." The teacher brings the referents of the concept to her students with objects to be tasted, a mirror to see taste buds, a chart, and a drawing on the board. The teacher also attempts to evaluate the lesson by determining what the children have learned.

2. In this non-oral episode, an elementary student teacher presents the concept "Archaeologists use certain terms to classify artifacts." He teaches without talking at all to the children. He brings the referent itself for the students to see; he tries to help them focus on the particular side of the object; he uses the board, his hands and his face to praise, encourage, question and reinforce a student's idea. The viewer will be interested to observe that when the teacher becomes silent, so do the children.

3. This episode, also non-oral, shows junior high students in a first-year Spanish class. The student teacher does not speak so as to helps students learn the names of six colors. The viewer will notice excellent use of visual aids. Students appear to be completely involved

as they are instructed and then tested. The teacher was working on reinforcing and using behavior.

4. In this episode a junior high-Spanish student teacher attempts to teach the meaning of the words "grande" and "pequeño" without talking. The referents for the symbols are shown in a way which involves all the students. Relative size is also taught. The teacher uses tasks and facial expressions to encourage, praise, and reinforce pupil responses.

5. The concept to be learned in this episode is that "The three sources of industrialization are manpower, capital, and natural resources." Pictures and the chalk board are used to teach. Students are completely engulfed in the lesson. The student teacher shows many ways of involving students and keeping their attention.

6. The elementary student teacher in this episode is working with three children in third to fifth grades. Using modified inquiry training, and using, sometimes successfully with elementary children, the teacher teaches a concept about separation of liquids. Part way through the lesson, she stops and helps the children improve their questioning. She then lets them continue. The teacher shows importance occasionally by talking too much herself. She reinforces the children's good questions very well.

7. This episode shows the student teacher teaching a concept dealing with lenses and light rays using inquiry training. She uses a chart to show the referents of the concept and summarizes for the students as they question. She also reinforces questioning which is relevant and deemphasizes irrelevant questions. Most of the students had not used inquiry before. One key needed help in asking one question at a time rather than stating a hypothesis which included many ideas.

8. The student teacher in this episode lets four secondary students ask questions to learn how a large piece of pottery was formed. Two of the students had used inquiry methods before. Without guidance from the teacher, the students asked questions which moved on and off the main objective of the session. No student-teacher evaluation of the pupil questioning is shown.

The second type produced is a description of various ways of critiquing microteaching sessions.

Participation in Workshops and Conferences

Members of BYU's Teacher Education faculty have prepared and read papers on four different occasions.

At the Annual American Education Research Association Convention held February 1967 in New York City, Dr. Hugh Baird conducted a symposium on the use of microteaching in the training of teachers at which time Dr. Dwayne Belt of BYU read a paper entitled "Microteaching: Observed and Critiqued by a Group of Trainees".

At the annual meeting of the Utah Association for Student Teaching held at Weber State College on April 19, 1967, Dr. Hugh Baird and Clark Webb of BYU presented a demonstration on microteaching in the training of elementary teachers and read a paper entitled "A Summary of Selected Research on Microteaching".

At the semi-annual meeting of the Utah Academy of Arts, Sciences and Letters, Clark Webb read a paper describing a three-year research project substituting microteaching experiences for part of a student teacher's time in a public school classroom. Dr. Dwayne Belt read a paper describing microteaching activities at BYU.

At the annual Utah M-STEP Conference held in May 1967, a series of eleven presentations were made, all relating to microteaching activities at BYU. The list of presentations follows:

- Hardware Display. Video recording equipment from AMPEX, SONY, and CONCORD was included. Broadcast Services personnel were available to answer questions, quote prices, demonstrate and report on their experiences with the equipment.

- Kinescope Showing. The kinescope "Microteaching at BYU" which was made by M-STEP for the Utah Conference at Park City in July 1966 was shown to those who wished to see it.

- Group Microteaching Without Videotape Equipment. Four groups of Teacher Education students engaged in microteaching simultaneously. Concept and motor act lessons were presented and evaluated by the students.

- Variety of Methods of Critiquing. A variety of critiquing procedures used in microteaching were described and demonstrated.

- First and Last Microtapes. A student's initial microteaching performance was shown, and then another performance was shown after the student had received help from an instructor.

- Interviewing Prospective Teachers - Experiment. Administrators rated teachers from interviews and credentials, and these ratings were compared to the ratings other administrators gave these teachers after viewing them in microteaching sessions from videotapes.

- Use of Modeling - Live or Taped. A live demonstration of a model of "inquiry training" was presented and discussed. Modeling as used at BYU was explained.

- Showing of Prepared Model Tapes. Model tapes prepared at BYU were shown and a discussion followed relative to how model tapes may be used in large and small teacher education classes.

- Visitors Microteach and View Privately with Secondary Students. Visitors at the M-STEP Conference were invited to microteach secondary students and view the videotape of their sessions privately.

- Visitors Microteach and View Privately with Elementary Students. Visitors at the M-STEP Conference were invited to microteach elementary students and view the videotape of their sessions privately.

- Demonstration: Microteaching with Elementary School Children. Prospective elementary teachers microtaught a group of elementary school children. Each presentation was followed by a critique of the lesson by the teacher and her instructor.

Dwayne Belt, Hugh Baird, and Clark Webb, all of the BYU staff, have been asked to collaborate in writing two articles to be included in a national M-STEP publication. One of these is a status report of microteaching in the training of teachers; the other is a report on selected microteaching research.

Other Activities

In addition to the above described activities, Brigham Young University experimented with the production of teaching episodes on 8 mm sound film loops. These episodes

were initially prepared on videotape, transferred to 16 mm kinescope and ultimately to 8 mm sound film which was cartridged for loop presentation. The content of the film loops produced is not as significant as the usability of the product and demonstration of the fact that 8 mm sound film loops can be made successfully from videotaped episodes.

An experiment was conducted at the M-STEP Conference in May regarding the use of videorecordings in the employment of teachers. Data are presently being analyzed, and a brief report will be submitted later.

Some Implications for the Future

The principle of a scaled-down teaching situation and particularly the freedom allowed by videotapes lead to exciting considerations of possible future applications of these methods. Although many other ideas could be advanced, three areas of application will be suggested here:

The Videotape Bank. Videotapes of specific teaching sequences could be stored for immediate retrieval for specific purposes. For example, varied classroom situations could be videotaped, according to grade level or socio-economic criteria or any other appropriate classification. These could be drawn from the bank when, in the teacher education sequence, the instructor wanted the student teachers to learn about a particular situation. Again, as an aid to the trainee in overcoming "reality shock", sequences on videotape could be shown in the college classroom. Another use might be the presentation of excellent teaching sequences or even their counterpart, poor teaching examples. A bank of videotapes would not only be helpful to the college instructor but also to a supervisor of in-service education for teachers. Videotapes illustrating problems of motivation, readiness, and adjustment on the part of pupils could be utilized with teachers in both pre-service and in-service situations.

The Student Teacher on the Job. Observation of student teaching could enter a new phase with the videotape process. Microteaching could take place in the elementary or secondary school room as well as in the college classroom. In addition, evaluation sessions could be held at the college using a videotape made "on location". A further possibility would be the videotaping of the student teacher's future student teaching assignment; that is, the class to which he would be assigned as a student teacher would be videotaped with its regular teacher and played back for the trainee's benefit. Accelerated orientation to the situation might be a significant result of such application.

The Student Teacher and His Self-Concept. One of the dramatic results of the microteaching experiments so far at BYU has been the student's intense reaction to viewing himself on videotape and receiving immediate feedback relative to his performance. The combining of these tools with that of interaction analysis could be a behavior-changing force of powerful influence. Timid, diffident trainees can be reinforced by the instructor in microteaching in ways that will build self-confidence. Conversely, cocky, over-confident trainees can quickly be shown reality.

Granting the assumption that conceptual learning proceeds more effectively as contact with the referent is increased, microteaching assuredly will take on greater and greater importance as it is realized that this technique provides just that: increased contact with the referent, teaching.

PRODUCTION OF RECORDED CLASSROOM EPISODES AT COLLEGE OF SOUTHERN UTAH*

Introduction

In the Fall of 1966 the Education Division of the College of Southern Utah submitted a revision of an earlier proposal to be a participant in the Utah M-STEP project. The proposal suggested the production of a series of videotaped classroom episodes covering: (1) Superior Teachers at Work, (2) Student Teachers at Work, and (3) Structured Observations of Classroom Activities.

A dramatic breakthrough in the difficulties of producing small, economy-priced videotape recorders had suddenly placed them virtually within the grasp of every teacher training institution and every public school system. There were a number of unanswered questions concerning such VTR equipment and its use in the public schools and small colleges. It was the hope that this project could supply answers to some of these problems. Specifically it was hoped that it would:

1. Provide in-service training in the use of this new medium for professional personnel working with student teachers in this area--cooperating teachers and college supervisors in the Teacher Education program.

2. Help determine if video processes have potential for reducing the laboratory or actual classroom time of pre-student teaching and student teaching experiences.

3. Determine some of the problems created by new media as they relate to building plans and needed curriculum changes in order to avoid making costly errors in designing curricula and buildings around untested ideas.

4. Discover some of the problems which may develop between the college and the public schools with regard to the professional performance and commitments of public school teachers.

5. Upgrade teaching competence in all areas of classroom performance by providing a dramatic and graphic means of self-analysis.

*Project Advisor: Dr. Morris A. Shirts, Dean, School of Education, College of Southern Utah, Cedar City.

Professional Relationships

Discussions were held with the Iron County school personnel to determine the extent of the commitment possible from the teachers and administrators of the Iron County Schools. Contact had been established earlier in the year, at which time the necessary support was pledged, but delay until the closing weeks of the school year posed special problems. Wholehearted support was, nevertheless, eagerly reaffirmed. Assignments were made and enthusiastically accepted by the six staff members of the School of Education of the College of Southern Utah, and plans for specific tapes were tentatively made. No outside technical assistance was solicited as one of the project's basic goals was to ascertain what special training, if any, was necessary for regular school personnel to enable them to acceptably operate the VTR equipment. The technical operation of the entire project was begun and completed by seven people (six college professors and one college sophomore) who had little or no previous training or experience in video processes.

Technology Relationships

At the outset of operation no previously existing VTR equipment was owned by or available at the College of Southern Utah to support this project. When the proposal was submitted, a planned sequence of events was set in motion involving the collection of facts about VTR equipment. Demonstrations were arranged with several VTR dealers; these continued throughout the school year. A sizeable file of technical information and notes accumulated from these demonstrations. When the contract arrived from the State Board of Education, it was not a difficult task to compile a list of adequate, portable, and relatively inexpensive equipment and specifications needed for the task.

One stipulation made by the State Board of Education which was not originally anticipated and which gave considerable apprehension as to the success of the project was that the videotapes had to be made on one-inch tapes compatible with the Ampex 7000 Videotape Recorder. Since the equipment we had in mind involved half-inch recorders (due mostly to smaller size and cost), this stipulation presented a discouraging problem. If we wanted to go ahead with the project, we had but two alternatives: (1) to purchase one-inch equipment which our budget would not permit, or (2) to produce the tapes on one-half-inch tape and then "dub" them to a one-inch tape. However, we were advised this could not be done with acceptable results. We decided to go ahead with the second alternative and stipulate to the bidders that they would need to demonstrate to the State Board of Education M-STEP Director that the "dubbing" could be made satisfactorily and would also submit documentary evidence that the product was of acceptable quality for the M-STEP program.

The College of Southern Utah added $3600 to the project. This was the amount needed to purchase one Ampex 7000 VTR unit and recording tape which could be used in the

original recording, if necessary, as well as the dubbing. This Ampex unit would become part of the console equipment of a developing closed circuit television network at CSU when the M-STEP project was completed.

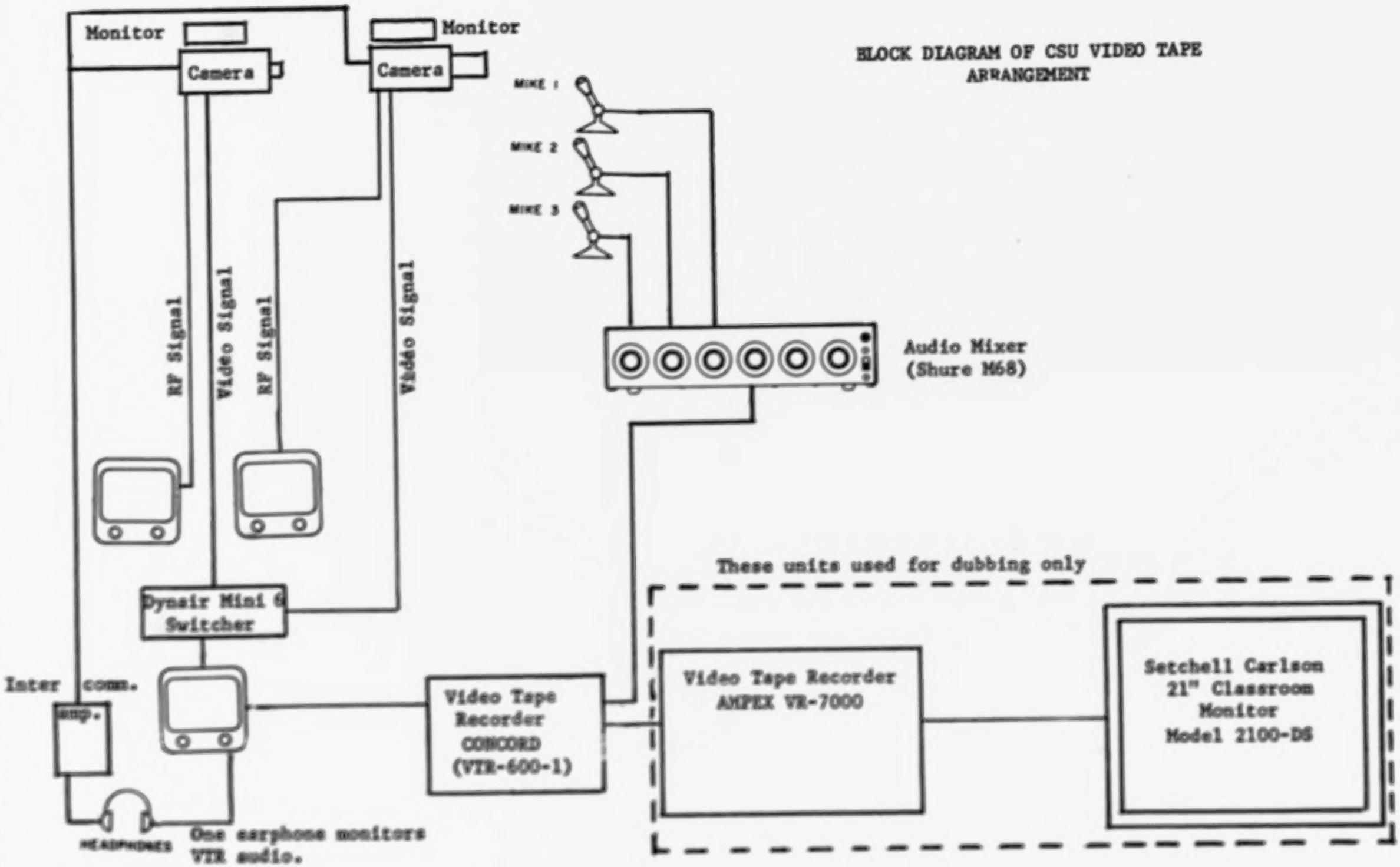
Equipment Used

The equipment had to meet certain technical specifications, but our primary concern was to produce acceptable recorded episodes with as little disruption of regular classroom activities as possible. Consequently, no supplementary lights were used. "Boom" mikes were also ruled out. The natural lights of the classroom and three microphones (two on stands and usually a lavaliere type for the teacher) were used. Two simple camera chains were used. One camera was equipped with a zoom lens (1-4, f1.5) and used primarily for close-up work with the teacher and small groups of students, and the other camera was equipped with a normal 25 mm f1.8 lens for general classroom observation. Both cameras had individual monitors at the camera station as well as monitors in the "console" and were switched through a Dynair Mini-6 Switcher into the VTR unit through a third console monitor. The third monitor was added after the bids were let because early experience indicated that it was not only necessary to monitor the signal from the camera but also the signal being fed to the VTR unit. The three microphones were likewise fed into a mixer (Shure M-68) switching arrangement which permitted the console operator to ride gain on the various microphone inputs and balance the output of the Concord VTR 600-1. The cameras were also Concord (Models MTC-12) with three-inch monitors "jeeped" on top. The console monitors were Concord and Panavision models adapted to work with the Concord VTR unit. The Ampex unit could have been used to produce one-inch tapes; but because of size and other factors, it was decided to use more portable equipment in the public school classrooms and later to dub to one-inch tapes using the Ampex 7000. (See diagram showing the relationship of the various components of this equipment.)

Problems That Developed

Considering the inexperience of the staff, the year-end school conditions and the time limits under which the project was conducted, the program was completed with relatively few difficulties. Some problems were inherent with the equipment itself while others were due to the inexperience of the staff. The fact that the project was completed ahead of schedule, however, is testimony in and of itself that it is feasible to use VTR equipment in the classroom without a highly-trained technical staff. For the benefit of those who might be considering similar operations, the most perplexing problems are identified as follows:

BLOCK DIAGRAM OF CSU VIDEO TAPE ARRANGEMENT



Side View Showing Camera and "Scoped" Monitor

Top: Top View of Equipment Stowed in Console/Carrying Case

Left: Front View of Monitors in Console/Carrying Case

Poor Quality Audio. Faithful reproduction of classroom sounds was impossible with the audio equipment herein described. Most people today are so conditioned to hearing professional quality reproductions of sound that anything less is not acceptable. This quality can partially be achieved through the use of such a device as a "boom" microphone, but the use of such an instrument detracts from the normal operation of the classroom. In this project we preferred to maintain a "normal" classroom situation to the achieving of better sound quality. The best possible compromise under present conditions was to place the microphones in locations where the audio response was expected. The most distracting audio problem of this project was a sixty-cycle background noise which could not be eliminated. We learned how to minimize this annoyance by isolating various components of the equipment and by the proper manipulation of input and output volumes in the sound system. After the project was completed, the problem was discovered to be an isolated defect in the VTR unit which the factory is correcting on all new models.

Video Difficulties. Three types of video interferences were encountered. One was the result of improper setting of the video control on the VTR in the record mode and was corrected after the first few recordings. The other two interferences were traced to equipment weaknesses and were the result of "jeeping" the small monitor to the camera. One was a series of horizontal "scratch" marks which appeared over the face of the recorded image. This weakness was traced to a loose terminal connection inside the camera. The other type of interference was characterized by a series of overlapping light and dark horizontal bars across the face of the image. This difficulty was traced to the power supply of the "jeeped" monitor which was located too near the vidicon tube in the camera and created a superfluous electromagnetic field which affected the proper operation of the vidicon tube. Both of these difficulties have been corrected.

Cleaning the Video Recording Heads. Care had to be exercised to keep the video recording heads clean. Dirty heads caused a "snow" effect on the recording similar to that present in TV receivers where the broadcast signal is very weak. Recording heads in some VTR units are easy to keep clean, but some require a thorough cleaning with special cleaning solutions. The more involved cleaning tasks should not be attempted without a careful reference to the equipment manual and probably would be accomplished better if performed by a qualified technician.

Editing and Splicing VTR Tape. Editing and splicing VTR tape proved to be more difficult than the instructional manuals indicated. The half-inch tape was easier to splice than the one-inch tape. In both cases care had to be taken in trimming the surplus splicing tape from the splice so as not to remove any of the recording tape. Splicing usually resulted in a temporary disruption of both the play and record modes since the sync and control tracks on the tape were cut. Editing must be cued on the audio signal since it is almost impossible to edit videotape practically by cuing on the video signal as the editing point. The audio signal was easy to monitor, but it was not practically coincidental with the video signal. The editing point was easy to identify aurally through the monitor and could be identified visually by marking the tape with a marking pencil. VTR equipment could be better designed to aid this marking process. We were able to edit our tapes quite skillfully with only a slight interruption of the video signal.

Lighting Conditions. Generally speaking, the normal lighting conditions of the classroom were sufficient to achieve a reproduction of good quality. The only real difficulty encountered came in situations where the camera faced the light from an outside window. In these instances the camera controls automatically compensated for and adjusted to the outside light, resulting in an under-exposure of the desired image. Under circumstances where it was impossible to locate the camera to avoid pointing into the outside light, the curtains were drawn or the windows covered. This physical adjustment created a focusing problem as the lens aperture had to be opened full which reduced the depth of the field of the lenses so that only parts of the desired image were in proper focus.

The Availability of Technical Repair Service. When something does go wrong with a piece of technical equipment, what can be done if technical repair service is not available? The fear of this problem was more serious than the actuality of the problem itself. On several occasions the dealer was called long distance for consultation. On one occasion he drove from Idaho Falls, Idaho to Cedar City, Utah... about an eight-hour drive...to repair the equipment. On this occasion, tape had become entangled in the revolving video recording head, resulting in a complete breakdown of the equipment. It was impossible for this to happen, but it did. The scarcity of adequately trained videotape repairmen in this geographical region presents a real problem for videotape users and salesmen.

Results of the Program

No controlled, experimental conditions were attached to this project. The contract simply called for the production of two recorded classroom episodes. Implied in the contract and explicit in the proposal was the idea of probing the potential of videotape recorders in teacher education. From this experience, although lacking statistical evidence to support them, the following conclusions and recommendations have been drawn:

Teachers Can Operate VTR Equipment. An extensive range of technical expertise is not necessary to produce the type of recorded episodes developed in this project. However, teachers cannot expect to add this function to their present schedule without some time commitment. The planning, arranging, actual taping, and editing and dubbing process consumes considerable time to complete. Student college or high school students might be trained to do some of this work, but it must be recognized that videotaping is very demanding in time. Teachers should not be expected to do an adequate job in this area if it is merely added to present load.

Inexpensive VTR Equipment Now on the Market Can Be Used. A basic unit consisting of a recorder, a camera, and a monitor can be purchased for approximately $1,000. As the use of this medium is greatly adopted by more and more teachers, the cost will probably be further reduced. An expenditure of over $1,000 for such equipment should be within the resources of most institutions. Varying aims and objectives may require that additional items be added to the basic unit.

The One-Half Inch VTR Tape Should Be Seriously Considered. In terms of cost of the recording tape alone, budget-minded administrators should give the one-half-inch recorder serious consideration, for it is much less expensive than the larger tape. In addition to this economy factor, smaller tape equipment is more portable, less complicated to operate, and less expensive to purchase, maintain, and repair. The quality of the one-half-inch tape seems to be equally as good as the larger tape. For purposes of this project, the smaller tape appeared to have a greater all-around utility. It is our opinion that one-half-inch tape will become the standard for classroom use, even though CCTV networks seem to have more of less standardized on the use of larger tape. Thus, there will may be two "standards" in size of tape to be used. In our estimation, the advantages of the one-inch tape are not distinct or significant enough to offset the advantages of one-half-inch tape mentioned above. We also feel that industry must make

compatible VTR units. Audiotape manufacturers faced this problem in developmental stages and solved it; it is imperative that a standard be established for VTR's. In some instances tapes are not even interchangeable on units produced by the same manufacturer. Tapes produced on one-half-inch VTR's should be capable of being played back on any other half-inch VTR.

Dubbing is an Accomplished Fact. A source of anxiety at the outset of this project was concern about the quality of reproduction when videotaped material on one-half-inch tape was dubbed to one-inch tape. The conclusion of this experiment is that such fear is groundless. The process was rather easily and effectively accomplished. While there may be some loss of picture quality when dubbing is employed, such loss is to be expected in virtually any situation where an original is being copied, whether in art or in printing or in videotaping. Furthermore, it is doubtful that the amount of quality loss can be precisely measured. Some experts have predicted that a 25 per cent loss can be expected, but we doubt that such can be observed in the process described in this report. While the quality of the tape reproduction may not meet broadcast or professional standards, it certainly is effective and adequate for normal classroom use.

Audio Visual Education Classes for Prospective Teachers Should Include Instruction on the Use of Videotape Equipment. Prospective teachers should have an opportunity to learn and become proficient in the operation of videotape equipment. This type of learning could most profitably be incorporated in most audio visual courses of instruction, along with the traditional study of the operation of motion picture projectors, tape recorders, etc. The readjustment necessary to include videotape equipment is such courses would be minimal once the equipment has been acquired.

In-Service Programs Should Be Organized to Help Practicing Teachers Become Proficient in the Use of Videotape Equipment. The classroom teachers who worked with this project were eager and anxious to learn how to use this videotaping equipment. Without exception, the climate in the classrooms was most enthusiastic; and the students, as well as the teachers, were obviously stimulated and challenged. The teachers seemed to be especially anxious to operate the equipment themselves with no one else around to see the results of their teaching! Practically every teacher commented favorably as to how he could effectively use such equipment to improve the quality of his teaching. As an instrument for in-service growth, the videotape recorder has great potential.

Salesmen and Sales Agencies Should Do More Than Sell...They Should Provide Service. Operating VTR equipment is one thing. Repairing and maintaining it presents a serious, complicated problem. Schools which purchase such equipment should be assured of the availability of competent and prompt maintenance and repair services.

The appraisal of this project and its equipment use and problems seems to suggest that one of the following arrangements for service on the equipment would be worthy of consideration:

A Dealership with Technical Repair Service and Salesmen Who Are Also Technicians. Under this arrangement, salesmen on the road could take care of the usual maintenance and repairs needed. The vendor could then also stand behind the produce with his technical repair service.

Media Center Technicians. With the establishment of the multipurpose instructional media centers in many areas, a maintenance and repair service could be added to care for the servicing of videotape equipment of participating institutions.

State-Supported Regional Repair Centers. If videotape recorder units are to become as popular as present indications lead us to believe and since a large number will be purchased with public funds, it could prove economically feasible for the State to support the establishment of regional repair shops for all instructional media equipment, including VTR's.

VTR Units Can Be Used to Reduce or at Least Supplement Laboratory Experiences in Teacher Education. Time was too limited in this project to establish statistical evidence as to the usefulness of VTR units in Teacher Education. However, we have a firm conviction, after having had the experience, that it can be effective in preparing the college student for the actual classroom situation.

War-Surplus Computer Tape Can Be Used in Videotape Recorders. Near the end of the project some war-surplus one-half-inch computer tapes became available. VTR salesmen and factory representatives suggested that the quality would not be suitable for videotaping. A microscopic examination of the oxide emulsion indicated that the tape made for the VTR contained finer oxide granules and that the computer tape had picked up some dirt. In addition, the surface of the computer tape was not quite as uniform as the videotape. In an emergency situation, however, the computer tape was used and the results were

satisfactory. Little difference could be detected in the quality of the recorded image. Undoubtedly the use of the computer tape will cause excessive wear on the recording heads of the VTR unit and it might be necessary to clean them more often, but the results are, nevertheless, satisfactory. We plan to use computer tape more extensively even if it necessitates the replacement of the recording heads earlier than would otherwise be required. Computer tape costs about one dollar and fifty cents ($1.50) per 1200 feet while the cost of videotape is in the neighborhood of thirty to forty ($30-$40) dollars per 1200 feet.

DESCRIPTION OF TAPES PRODUCED

THE FATHER IMAGE — Filmed at: East Elementary School, Cedar City, Utah — Time: 19 minutes

This episode presents information emphasizing the opportunity for men as elementary teachers. It briefly follows the activities of two teachers in the classroom and one outside the class in pointing out the challenge and opportunity for men in the elementary school.

MISFITS — Filmed at: Cedar Junior High School, Cedar City, Utah — Time: 17 minutes

This episode takes a look at five students, each of who represents a type of junior high school adjustment problem, and points out how an activity program in art helps these students overcome their personal difficulties.

WHO'S RESPONSIBLE? — Filmed at: North Elementary School, South Elementary School, Cedar City, Utah — Time: 18 minutes

This episode proposes that one of the best ways that elementary school children can learn is from and with each other. It shows three segments, one from kindergarten, one from first, and one from second grade where students are very busy, conducting learning experiences mostly self-motivated.

HOW DO I TEACH THIS LESSON?

Filmed at: Cedar Junior High School, Cedar City, Utah — Time: 19 minutes

This episode uses junior high school social studies (geography) for background and emphasizes that there are many ways to teach a lesson. It points out that the method for any particular lesson should be selected on the basis of four criteria.

HELPING EACH OTHER

Filmed at: North Elementary School, Cedar City, Utah — Time: 16 minutes

This episode is designed to emphasize how well students learn when they help each other. Its setting has a brief bit from a before-school math class in the first grade, but the majority of the film follows work in a third-grade reading session.

TEACHING LANGUAGE ARTS IN THE FIRST GRADE - Part I

Filmed at: North Elementary School, Cedar City, Utah — Time: 25 minutes

This episode shows first grade pupils involved in practical language situations. First, with the teacher acting as a scribe, they compose an attendance chart. After the chart is finished, the children read it together, picking out interesting words and sounds. Later two of the children write a weather chart which they share with their peers.

TEACHING LANGUAGE ARTS IN THE FIRST GRADE - Part II

Filmed at: North Elementary School, Cedar City, Utah — Time: 25 minutes

This episode shows additional language arts activities in the same first-grade classroom. The children read the door chart, check a job chart to see if they have been assigned tasks for the day, sign-up for school lunch, read from books, write news stories about themselves which they share with their classmates, and finally read poetry together while eating their mid-morning lunch.

CREATIVITY

Filmed at: East Elementary School, St. George, Utah — Time: 21 minutes

This episode shows a panel discussion involving five teachers who spent one year working together to examine creativity in teaching. The results of their work together and their problems and successes in the classroom are discussed.

ELEMENTARY STUDENT TEACHING--PLANNING, TEACHING AND EVALUATING

Filmed at: South Elementary School, Cedar City, Utah — Time: 21 minutes

This episode is designed to show the elementary student teacher at work. She is shown planning and evaluating with her cooperating teacher. The setting is a kindergarten where the opening activities of the day and arithmetic readiness skills are presented and taught.

SECONDARY STUDENT TEACHING--PLANNING, TEACHING AND EVALUATING A LESSON

Filmed at: Parowan High School, Parowan, Utah — Time: 16 minutes

This episode shows a secondary student teacher at work. He is shown planning and teaching a lesson and evaluating the results with his cooperating teacher. The setting is a senior high mathematics class.

HOW TO TEACH A SKILL

Filmed at: College of Southern Utah, Cedar City, Utah — Time: 20 minutes

This episode was made at the College of Southern Utah in a Water Safety class. A skill lesson plan is developed and used in a teaching situation. The subject matter is Mouth-to-Mouth Resuscitation and is designed to show prospective teachers how to teach a skill.

PRACTICAL ARITHMETIC EXPERIENCES IN THE PRIMARY GRADES

Filmed at: Parowan Elementary School, Parowan, Utah — Time: 26 minutes

This episode shows how a skilled primary grade teacher uses the mid-morning lunch program as a focal point for many practical experiences in arithmetic.

APPLICATION OF A CONCEPT

Filmed at: Cedar City High School
Cedar City, Utah

Time: 27 minutes

This episode is part of the culminating activity of a unit in speech taught by a student teacher. Its purpose is to demonstrate how ideas learned and understood can be transferred into living experiences within the classroom.

VIDEOTAPED PEER TEACHING (MICROTEACHING) AT THE UNIVERSITY OF UTAH*

Background and Purpose

Interest in the utilization of microteaching techniques in the teacher training program at the University of Utah began with the Peace Corps Training Programs of the University in 1965 and 1966. Peace Corps training required a focus upon specific teaching skills and the acquisition of these skills by trainees in a minimum amount of time. During the training program use was made of the Closed Circuit TV equipment facilities at the University of Utah. This preliminary experience suggested that the techniques could be usefully employed in the broader teacher education program of the College of Education.

In the summer of 1966 a formal proposal was developed to acquire support for the purchase of equipment and time to pursue the microteaching notion. With the help of M-STEP, through the State Department of Education, such support was obtained and the microteaching program developed.

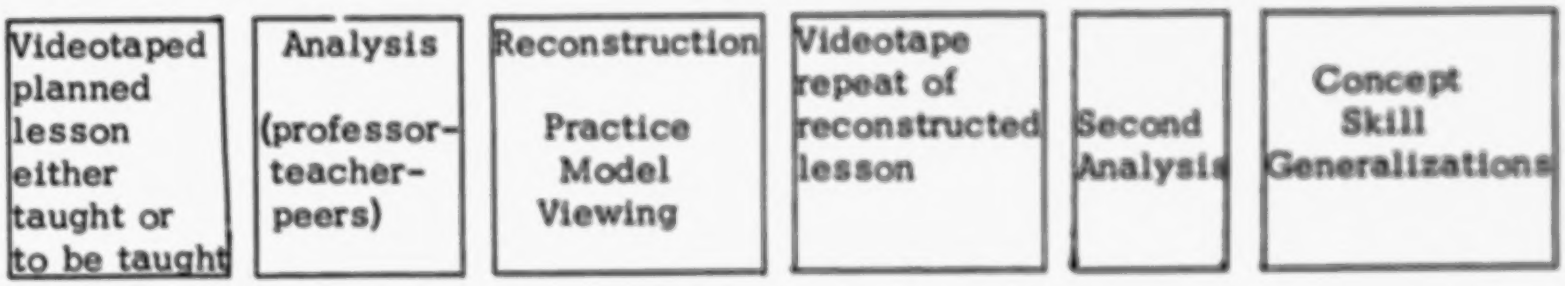
Definition of Microteaching

The purpose of microteaching is to isolate some aspect of the teaching task and then to use this "captured" bit of teaching for instructional purposes. There are several areas of possible use. Microteaching is most commonly used in teacher education. The microteaching is done by the prospective teacher. There follows an analysis by the teacher-trainee and a professor, and this is followed by practice of what has been learned. By illustration, the professor may want a prospective teacher to learn to ask questions designed to elicit certain qualities of thinking. The teacher-trainee would plan and prepare a short lesson containing such questions and teach it to a group of his peers or to a class of students if such is available. This is followed by an analysis of the videotaped lesson with the teacher-trainee, the professor, and the peers all participating in the analysis. Then, of course, the teacher-trainee does the lesson again. It is easy to see how such microlessons could be prepared in areas as organization, focus, synthesis, generalizations, and simple delineations of factual materials. Incidentally, it is inevitable that some attention be given to such teacher characteristics as voice, manner, bearing, enthusiasm, and vocabulary.

Microteaching is a segment of real teaching (peer teaching). Student teachers videotape lessons, or parts of lessons, that they either have taught in the schools or that

*Project Director: Dr. Earl W. Harmer, Professor of Education, University of Utah, Salt Lake City.

they intend to teach. The purpose is to provide immediate feedback, reconstruction of the lesson, and reapplication of the lesson. In diagram form the microteaching sequence might look like this:



Equipment and Staff

Equipment utilized in microteaching now consists of one Ampex 7000 (a videotape recorder), plus a camera and a video receiver. This equipment is located in the Audio-Visual Room of Milton Bennion Hall. The room has been arranged so that it simulates a conventional classroom. Writing arm chairs, blackboard, and other typical school room facilities are available.

The utilization of the equipment has been extensive within the Department of Education. At least six professors in the Department have made some use of microteaching within their programs. In addition, the equipment has been used by other departments on campus. For example, the Theatre Arts Department has made regular video recordings.

It is projected that some of the heaviest use of the equipment will come during the conventional summer school program and the Peace Corps training.

Curricular Procedures

The basic use of microteaching has been in connection with the student teaching methods - professional quarter for prospective secondary school teachers. At the University of Utah student teaching on the secondary school level is accompanied by a required course in methods. This course meets for two hours a day, three days a week. It is during this period of time that the student teacher will simulate and videotape lessons that he either will teach or has taught during his student teaching.

Tentative Conclusions

- Student teachers approve of the technique, believe it is very helpful in student teaching, and would like to have all student teachers participate.

- It is most important to train (microteach) for no more than one or two skills at a time.

- Microteaching "lessons" actually taught in public schools have greater impact than "artificial" lessons.

- The microteaching lesson should be short (5-8 minutes) and the critique should follow the lesson immediately.

- Having student teachers participate occasionally in the critiques seems to sensitize the student teacher to analysis and behavior reconstruction.

- Teaching skills to be learned (through microteaching) need to be preplanned by professor and student teacher.

- The range of possible teaching behaviors in which microteaching is useful is extensive. Superior "quality of skill" requires extensive effort and practice.

- Microteaching is an excellent tool in teacher education, but it is not a panacea.

Recommendations

It is recommended that the next steps in the microteaching program be:

- To obtain good models of particular teaching skills.

- To develop more sophisticated and efficient procedures.

- To develop theory that is appropriate to the training.

- To explore the possibility of videotaping student teachers' actual work in the schools.

- To consider microteaching as a criterion for Admission to Teacher Education.

- To develop evaluation designs that could help determine whether or not what seems to be worthwhile actually is.